AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Currently Amended) A method for use in measuring the volume of fuel in a fuel tank in a vehicle subject to varying external forces caused by movement and roll and pitch angles of the vehicle, comprising the steps of:

mounting a fuel tank to the vehicle so that it is movable along the yaw or vertical axis of the vehicle;

providing at least one analog signal in proportion respectively to the load on at least one tank load cell, each of the cells being placed between a portion of the fuel tank and a portion of a reference surface of the vehicle, and the cells being sensitive along an axis substantially normal to the reference surface and generally parallel to the yaw axis of the vehicle;

arranging an inertial measurement unit (IMU) on the vehicle to determine the pitch and roll angles of the vehicle;

providing signals proportionally representing the pitch [[or]] and roll ~~angles~~ angle of ~~said~~ the vehicle; and

converting the at least one analog cell signal and the pitch [[or]] and roll angle signals into output information representative of the volume of the liquid in the fuel tank by converting the at least one analog cell signal to a digital signal and inputting the digital signal and the pitch and roll signals into a processor having an algorithm, the algorithm using (i) the inputted at least one analog cell signal and the pitch [[or]] and roll signals independently (ii) with a derived relationship between the signals and [[the]] known fuel volume to output the fuel volume information.

2-20. (Canceled)

21. (Original) A method for measuring the volume of a liquid in a fuel tank in a vehicle

subject to varying external forces caused by movement or changes in the roll and pitch angles of the vehicle, comprising the steps of:

conducting a plurality of measurements, each measurement including the known volume of the tank and the value of at least three parameters concerning the tank, at least one of the parameters being the pitch or roll angle of the vehicle as determined by an inertial measurement unit (IMU),

generating an algorithm from the plurality of measurements for determining the volume of fuel in the tank upon the receipt of current values of the parameters,

inputting the algorithm into a processor arranged in connection with the vehicle,

measuring the same parameters during operation of the vehicle, and

inputting the measured parameters into the algorithm in the processor such that the algorithm provides the volume of fuel in the tank.

22. (Original) The method of claim 21, wherein the remaining ones of the parameters is selected from the group consisting of the load of the tank on a load cell arranged at a first location, the load of the tank on a load cell arranged at a second location, the load of the tank at a load cell arranged at a third location, the height of the fuel at a first location in the tank, the height of the fuel at a second location in the tank and the height of the fuel at a third location in the tank.

23. (New) The method of claim 21, wherein the at least three parameters include the pitch angle of the vehicle and the roll angle of the vehicle, the pitch and roll angle being determined by the IMU.

24. (New) The method of claim 21, wherein the IMU contains three accelerometers and three gyroscopes.

25. (New) The method of claim 21, wherein the at least three parameters include the load of the

tank on a load cell arranged at a first location, the pitch angle of the vehicle and the roll angle of the vehicle, the pitch and roll angle being determined by the IMU.

26. (New) The method of claim 21, wherein the at least three parameters include the load of the tank on a first load cell at a first location, the load of the tank on a second load cell at a second location, and the load of the tank on a third load cell at a third location.

27. (New) The method of claim 26, further comprising the steps of:

mounting the tank to the vehicle such that it is subjected to forces along the yaw axis of the vehicle, and

arranging the first, second and third load cells between different portions of the tank and the vehicle such that they are sensitive along an axis that is generally parallel to the yaw axis of the vehicle.

28. (New) The method of claim 26, further comprising the step of:

arranging the first, second and third load cells between the different portions of the tank and a portion of a common reference surface of the vehicle, the load cells being sensitive along an axis that is substantially normal to said surface.

29. (New) The method of claim 21, further comprising the step of:

displaying a signal representative of the volume of fuel contained in the tank.

30. (New) The method of claim 21, further comprising the step of:

placing a skirt under the tank to prevent the build up of mud or ice.

31. (New) The method of claim 21, further comprising the steps of:

determining the specific gravity of the fuel in the tank, and

inputting the specific gravity into the algorithm to be considered in a determination of the quantity of fuel in the tank.

32. (New) An apparatus for measuring the volume of a liquid in a fuel tank in a vehicle that is subject to varying external forces caused by movement or changes in the roll and pitch angles of the vehicle, comprising:

a fuel tank mounted to the vehicle and subject to forces along a yaw axis of the vehicle;

measuring means for measuring at least three parameters relating to said tank or the vehicle and generating output signals representative of the at least three parameters, said measuring means including an inertial measurement unit (IMU) arranged to determine at least one of a pitch and roll angle of the vehicle; and

computational means coupled to said measuring means for receiving the output signals and processing the output signals to obtain a volume of fuel in said tank, said computational means comprising means for storing an algorithm representative of a derived relationship between the at least three parameters and the volume of fuel in said tank and applying the algorithm using said output signals as input to obtain the volume of fuel in said tank,

said algorithm being obtained by conducting a plurality of measurements, each measurement including the known volume of the tank and said output signals from said measuring means.

33. (New) The apparatus of claim 32, wherein said IMU contains three accelerometers and three gyroscopes.

34. (New) The apparatus of claim 32, wherein each measurement includes the pitch angle and the roll angle of the vehicle as determined by said IMU.

35. (New) The method of claim 1, wherein the IMU contains three accelerometers and three gyroscopes.

36. (New) A method for measuring the volume of a liquid in a fuel tank in a vehicle that is subject to varying external forces caused by movement or changes in the roll and pitch angles of the vehicle, comprising the steps of:

generating an algorithm for use on the vehicle by placing a known quantity of fuel into the tank, collecting data from a plurality of sensor systems arranged in connection with the vehicle under various conditions from an at rest position to a driving state over a variety of road surfaces, repeatedly changing the quantity of fuel in the tank and collecting additional data from the sensor systems, inputting the data concerning the quantity of fuel in the tank and the data collected from the plurality of sensor systems into a neural network generating program to obtain an algorithm,

installing the algorithm onto a component in the vehicle,

obtaining data from the plurality of sensor systems during operation of the vehicle, and

inputting the data from the plurality of sensor systems into the algorithm to obtain the quantity of fuel in the tank,

wherein at least one of the sensor systems is an inertial measurement unit (IMU) and the data provided by the IMU is the pitch angle and roll angle of the vehicle.

37. (New) The method of claim 36, wherein the IMU contains three accelerometers and three gyroscopes.